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ABSTRACT

Type A behavior is characterized by impatience, aggressiveness, and ambition. Type B individuals are more relaxed, easy-going, and unhurried. This study examined the effects of behavior pattern (Type A, intermediate, Type B) and experimenter interest (high versus no interest) on the time allocated to an experimental task and task performance. Subjects were 40 undergraduate students at National Taiwan University. In the first work period all subjects were asked to solve as many anagrams as possible. In the second work period, the free-choice period, subjects were randomly assigned to a high experimenter interest or no interest condition. In the experimenter interest condition, subjects were told to pretest a different list of anagrams and a jigsaw puzzle. In the no experimenter interest condition, subjects were given no instructions. The results showed that subjects in the high experimenter interest situation spent significantly more free-choice time on the target task than did subjects in the no experimenter interest condition. In the high experimenter interest condition, Type A's, Type B's, and intermediates spent about the same amount of free-choice time on the anagram-solving task. Type A's, however, solved significantly more anagrams than did Type B's and intermediates. In the no experimenter interest condition, no difference in task performance was found. Study findings imply that work assignments should be expressed explicitly and that goal setting helps people achieve a high level of performance. A five-page reference list concludes the document. (Author/ABL)

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Effects of Type A Behavior Pattern and Experimenter Interest on Time Allocated to an Experimental Task and Task Performance

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Abstract

This study examined the effects of Type A behavior pattern (Type A, intermediate, Type B) and experimenter interest (high vs. no interest) on the time allocated to an experimental task and task performance. Forty undergraduate students volunteered for the study. The results suggested that subjects in the high experimenter interest situation spent significantly more free-choice time on the target task than did those in the no experimenter interest condition. In the high experimenter interest condition, Type As, Bs, and intermediates spent about the same amount of free-choice time on the anagram-solving task, however, Type As solved significantly more anagrams than did Type Bs and intermediates. In the no experimenter interest condition, no difference in task performance was found. Some implications as related to subjects' task performance during the free-choice period were discussed.

Effects of Type A Behavior Pattern and Experimenter Interest on Time Allocated to an Experimental Task and Task Performance

Evidence has accumulated in recent years that implicates a behavior pattern, designated as Type A, as a risk factor for coronary heart disease (CHD) (Freidman & Rosenman, 1974). This coronary-prone behavior is characterized by an extreme sense of time urgency, competitiveness, impatience, aggressiveness, ambition, frequent vocational deadlines, pressure for vocational productivity, and restless motor mannerisms and staccato style of verbal response (Jenkins, Rosenman, & Friedman, 1967). Type B behavior pattern is characterized by "the relative absence of this interplay of psychological traits and situational pressures" (Jenkins et al., 1967, p. 371). Type B individuals are more relaxed, easy-going, satisfied, and unhurried (Ivancevich & Matteson, 1984).

Type A personality is operationalized as a "continuous" variable ranging from extreme Type A to extreme B (Matthews, 1982). According to Jenkins et al. (1967), Type As and Type Bs may be further divided into two subgroups, i.e., A1, A2, B3, and B4, and "the bulk of the population appears to fall into the intermediate categories A2 and B3" (p. 372). It was reasoned that the inclusion of the intermediate category would enable us to examine the differences among Type As, Type Bs, and intermediates (cf. Baron, Russell, & Arms, 1985). The present research examined the effects of Type A personality (Type A, intermediate, and Type B) and experimenter interest (high vs. no interest) on subjects' time allocated to an experimental task and task performance during the free-choice period.

Type A and Work

Many studies examined the relationship between individuals' Type A behavior pattern and their "work-related" behavior. For example, Type As tend to work more

hours per week and travel more days per year than Type Bs (Howard, Cunningham, & Rechnitzer, 1975). Type A behavior pattern is correlated with job involvement (r = .34) (Jenkins, Zyzanski, & Rosenman, 1971), the Protestant work ethic (r = .39, and .32) (Tang & Baumeister, 1984), and other work related values, e.g., greater preference for keeping active and busy on the job, actively seeking a higher level position or standard of living, and pride in work (Burke & Weir, 1980).

Type As also tend to work at near their maximal rate when there is no explicit time deadline (Burnam, Pennebaker, & Glass, 1975; Carver, Coleman, & Glass, 1976). Type A college students also achieve more academic honors than do Type Bs (Glass, 1977). Matthews, Helmreich, Beane, and Lucker (1980) revealed that Type As have more publications and more research citations in a three-year period than Type Bs. Taylor, Locke, Lee, and Gist (1984) also replicated Matthews et al. (1980) study and found similar results. Boyd (1984) found that firms run by Type As showed a higher return on investment and greater five-year growth in sales revenue than firms run by Type Bs. It appears that Type As display a higher level of work involvement and produce higher quality and quantity of work performance than do Type Bs.

Type A and Perceived Demand

Salomon (1984) argued that one factor which affects the amount of invested mental effort is a person's perceived demand characteristics (PDC) of the stimulus, task, or context. The more demanding PDC is, the greater the amount of mental effort will be expended. Therefore, up to a point, increasing the PDC increases the amount of effort expended for goal attainment.

It has been shown in the literature that Type As manifest greater cardiovascular responses (e.g., Dembroski, MacDougall, Shields, Petitto, & Lushene, 1978) and greater systolic blood pressure (e.g., Manuck, Craft, & Gold,

1978; Manuck & Garland, 1979) than do Type Bs during a variety of challenging tasks. Goldband (1980) also reported that Type As manifest significantly greater blood pressures while working on a highly competitive reaction time task but not on the same task when competition is de-emphasized. Sales (1969) has suggested that Type As may possess personality traits that cause self-selection into jobs that involve a greater exposure to stressors and challenges.

Further, Type As focus on events that have been defined as being centrally important and suppress their attention to peripheral events and stimuli (Matthews & Burnson, 1979). Friedman and Rosenman (1974) observed that Type As show a low tendency to ponder leisurely. It was also suggested by Glass (1977) that Type As tend to work hard to succeed, to suppress subjective states (e.g., fatigue) that may interfere with task performances, and to conduct their activities at a rapid pace. Type As also have a strong desire to master the environment. Herman, Blumenthal, Black, and Chesney (1981) further stated that Type As may have the tendency to distort self-perception in socially desirable directions.

Hughes, Jacobs, Schucker, Chapman, Murray, and Johnson (1983) studied individuals' Type A behavior pattern and their nonverbal behavior. Their data revealed that Type As spent significantly more time moving about and exploring, and less time sitting still than Type Bs during both the waiting and the relaxation periods. During the interview period, Type As also gestured more frequently than Type Bs. It appears that Type As are more active and have a higher level of arousal than Type Bs in both interview and noninterview settings. It is reasoned that Type As may have considered the whole experiment as being centrally important. Therefore, Type As' nonverbal behavior in the interview settings does not differ from their behavior in the noninterview setting.

Based on the results of these studies, Type As display their coronary-prone,

competitive behavior pattern only if Type As experience a high level of perceived demand characteristics (PDC) in the experimental context, or tasks. Therefore, it was plausible that Type As would display different behavior patterns based on their PDC of the experimenter interest.

Tang and Baumeister (1984) suggested that task preference was a function of both personal values and task labels. Their data demonstrated that subjects chose to perform the target task most during their free-choice period when the label (i.e., work) led them to perceive the task in a way that corresponded to something they valued (i.e., high work ethic).

In the present study the experimental task was also labeled as "work". The effects of Type A behavior pattern and experimenter interest on subjects' free-choice behavior and task performance were examined. In the high experimenter interest condition, the experimenter expressed explicitly that the subject was expected to pretest on two different tasks during the free-choice period. The subject was also informed that he or she could work on whichever one or ones he or she felt like, to skip around, or just relax and do nothing. In the no experimenter interest condition, no explicit instruction was given to the subject for the free-choice period.

Following the rationale provided by Goldband (1980), Friedman and Rosenman (1974), Matthews and Burnson (1979), and Herman et al. (1981), the present author reasoned that when the experimenter asked subjects to pretest the two different tasks in the free-choice period, Type As would experience a higher level of PDC and would work harder and have better performance than would Type Bs. When the experimenter showed no interest in subjects' behavior, then Type As would consider the activity as not central to their success (i.e., a lower level of PDC) and would perform equally well as those Type Bs. Therefore, a significant interaction

effect between Type A behavior pattern and experimenter interest on subjects' task performance during the free-choice period was expected.

Further, an ANOCOVA was employed using subjects' task performance during the first work period as a covariate. The results of this analysis could be used to examine the extent to which subjects' free-choice behavior would be affected by their task performance in the first work period.

Method

Subjects

Subjects were 19 male and 21 female undergraduate students at National Taiwan University, Taiwan, Republic of China. They participated as volunteers.

Type A Personality Measure

A short measure of Type A personality (Sales, 1969; Vickers, 1975) was adopted for the present study. Each item of this brief, self-completed, nine-item scale is presented in the form of a seven-point, Likert-type scale ranging from "very true of me" (7) to "not at all true of me" (1). This Type A personality scale is correlated significantly with the Jenkins Activity Survey (r = .80) and is strongly associated with the presence of a number of coronary risk factors (French & Caplan, 1969). This scale has an internal consistency (estimated alpha coefficient) of .80 and has a high correlation with the longer scale, r = .90 (Vickers, 1975). The Type A personality scale used in this study was tested in a pilot study by the present author using 50 undergraduate college students. The test-retest reliability (with four weeks apart) of this Type A personality scale was .87. This short measure of Type A personality has been used in several studies (e.g., Byrne, 1981; Caplan, Cobb, & French, 1975; Caplan, Cobb, French, Harrison, & Pinneau, 1975; Caplan & Jones, 1975).

The measure of Type A coronary-prone behavior (Sales, 1969; Vickers, 1975)

was translated into Chinese by the author. The Chinese version of the questionnaire was independently translated back to English by two psychologists fluent in both Chinese and English. The aim of translation and back translation was to achieve loyalty of meaning and literal accuracy of the original measures. The present author made some minor changes based on the original English version, the Chinese version and the back translated versions. The final form of this questionnaire was thus regarded as possessing a satisfactory degree of cross-language equivalence. Psychometric properties of the Type A behavioral pattern and others as used in this Chinese sample and an U.S. sample were presented elsewhere (Tang & Baumeister, 1984). Generally, results suggested the comparability between the measures and the two samples.

Procedure

The personality questionnaire was administered to volunteers from 1 week to 3 months before the time of the experiment. Only one subject was involved in each experimental session.

Each subject was met by a male experimenter and escorted into the experimental room. The experimenter was blind as to whether the subject's score on the Type A behavior pattern was high or low. The subject was informed that the purpose of this experiment was to study people's "work" related activities. The subject was told that he or she would solve some Chinese anagrams. The development and construction of Chinese anagrams were based on previous work by Liu, Chang, and Yang (1979), Liu, Chiang, and Yeh (1977), and Liu and Yeh (1977).

The Chinese anagrams were described as similar to "work" activities, i.e., solving anagrams bore an important resemblance to many work activities, such as the work of a clerk, librarian, editor, advertiser, secretary, historian, and others. The instructions for the anagram-solving task specified that the subject

(a) could do the anagrams in any order, and (b) would have 15 minutes to solve as many anagrams as possible.

Before beginning the anagram task, the experimenter reminded the subject to "work hard". The subject then worked on the anagrams for 15 minutes, while the experimenter stayed in the same room reading a book. After the work period was over, the experimenter collected all finished papers. The experimenter then escorted the subject into a second room and asked the subject to sit at a table with another list of Chinese anagrams and pieces of a jigsaw puzzle.

The subject was then randomly assigned to either the high experimenter interest or the no experimenter interest condition. In the high experimenter interest condition, the experimenter told the subject that he was preparing a research project involving two tasks, i.e., Chinese anagrams and a jigsaw puzzle. A different anagram list was provided. The experimenter asked the subject to "pretest" them. All subjects consented. The experimenter explained that the major task for the subject to do was to determine which task was more interesting and which was easier than the other. Once the subject could make those two judgments, the subject could work on whichever one or ones he or she felt like, to skip around, or could relax and do nothing. The experimenter then told the subject that he would have to go and get a final questionnaire for the subject. Thus, the subject would believe that the experimenter was interested in how the subject spent his or her time.

In the no experimenter interest condition, the experimenter asked the subject to fill out a questionnaire but then pretended to discover that the questionnaire was partly illegible. The experimenter said that he would have to go and make a new copy of the questionnaire and asked the subject to wait there. The subject was then left alone for 15 minutes, presumably believing that his or her behavior

was entirely up to him or her and was not of interest to anyone.

The experimenter entered an adjacent room and observed the subject through a one-way mirror for 15 minutes, recording the amount of time the subject spent on each of the two tasks and relaxation. After the 15-minute free-choice period was over, the experimenter returned and gave the subject a final questionnaire probing the subject's feelings about the experiment and the various tasks. The subject was then debriefed and asked not to disclose the content and the purpose of the study.

Results

Subjects were classified as either Type A, intermediate (middle third), or Type B according to a three-way split in their scores on the Type A behavior pattern measure. Subjects' task performance, i.e., the number of anagrams solved, in the first period was analyzed by using a 3 (Type A behavior pattern) x 2 (experimenter interest) analysis of variance (ANOVA). No significant result was found. Therefore, subjects' performance was not affected by these two independent variables.

The main purpose of this investigation was to examine the effects of Type A behavior pattern and experimenter interest on task preference, as measured by the amount of time (in seconds) subjects chose to spend on the anagram-solving task during the free-choice period, and task performance, as measured by the number of anagrams solved during the free-choice period. A 3 (Type A behavior pattern) x 2 (experimenter interest) analysis of variance (ANOVA) on task preference revealed one significant result. The significant main effect of experimenter interest, F (1, 34) = 7.66, p = .009, omega squared = .137, suggested that subjects in the high experimenter interest condition spent significantly more time on the target activity during the free-choice period (M = 575.00) than did subjects in the no

experimenter interest condition (M = 294.55). The main effect of behavior pattern failed to reach significance, F (2, 34) = .80, p = .46. Therefore, Type As and Type Bs showed the same level of task preference on the target activity during the free-choice period. The interaction effect between behavior pattern and experimenter interest was not significant, F (2, 34) = 2.36, p = .11, omega squared = .055. Thereby, Type As' free-choice behavior was not different from that of Type Bs with or without experimenter interest.

It was also the interests of the present study to examine the number of anagrams actually solved during the free-choice period. The main effect of experimenter interest on task performance, F (1, 34) = 16.97, p < .001, omega squared = .236, revealed that subjects solved more anagrams in the high experimenter interest condition (M = 10.6) than did those in the no experimenter interest condition (M = 2.5). Further, the interaction effect between Type A behavior pattern and experimenter interest on task performance was significant, F (2, 34) = 5.99, p = .006, omega squared = .147. The means of the interaction effect are presented in Table 1. The main effect of Type A behavior pattern on task performance was not significant, F (2, 34) = 2.36, p = .11, omega squared = .04.

Insert Table 1 about here

For the high experimenter interest condition, the simple main-effects test was significant, F (2, 34) = 6.85, p = .003. Further LSD procedure suggested that Type As solved more anagrams during the free-choice period than did intermediates and Type Bs (ps < .05). In the no experimenter interest condition, the simple main-effects test failed to reach significance, F (2, 34) = 1.03, p = .368.

For Type As, the results of the simple main-effects test showed that Type As in the high experimenter interest condition solved more anagrams during the free-choice period than did those in the no experimenter interest condition, F (1, 34) = 22.20, p = .000. For Type Bs, similar result was found, F (1, 34) = 5.47, p = .025. That is, Type Bs in the high experimenter interest group also performed better than did those in the no experimenter interest group. However, for intermediates, the simple main-effects test was not significant, F (1, 34) = .01, p = .905.

Using performance on the first task as a covariate, the results of an ANOCOVA showed that the main effect of experimenter interest on task performance was again significant, F (1, 33) = 16.54, p = .001. Further, the interaction effect on task performance also reached significance, F (1, 33) = 5.80, p = .007. Therefore, subjects' task performance during the free-choice period was not affected by their performance during the first period.

Discussion

The present study examined the effects of Type A behavior pattern and experimenter interest on the time allocated to an experimental task and task performance. In the first work period, all subjects were asked to solve some anagrams. With the same level of perceived demand characteristics (PDC) and the presence of the experimenter, all subjects performed equally well on the task.

In the second work period, subjects were given a 15-minute free-choice period. In the high experimenter interest group, subjects were given some specific instructions to pretest some materials and were also asked to work on whichever one or ones they felt like, or just to relax and do nothing. Without the presence of the experimenter, subjects in the high experimenter interest group still experienced a very high level of PDC. However, in the no experimenter

interest group, subjects were given no explicit instructions at all. Therefore, subjects would perceive that their behavior during the free-choice period was completely up to them. That is, subjects in the no experimenter interest group would experience a very low level of PDC.

Salomon (1984) suggested that a person's invested mental effort is affected by his or her PDC of the stimulus, task, or context. The results of the present study suggested that subjects in the high experimenter interest situation spent significantly more time on the target task than did those in the no experimenter interest condition. Therefore, subjects' PDC may have played an important role in their free-choice behavior.

It should be pointed out that during the free-choice period, all subjects in the high experimenter interest group spend about the same amount of time on the target activity regradless of their Type A behavior pattern. This was also true for subjects in the no experimenter interest group. Subjects in the high experimenter interest group may have experienced a high level of PDC, therefore, all subjects spend about the same amount of time on the task in order to fulfill their role in the experiment regardless of their own personal preferences (i.e., Type A behavior pattern). Subjects in the no experimenter interest group did not receive any instructions from the experimenter, thus, they felt that they were not obligated to do anything during the free-choice period and had a very low level of PDC. Therefore, Type As, Bs, and intermediates spent very little, if any, time on the anagrams.

When subjects' task performance, as measured by the number of anagrams solved during the free-choice period, was examined, a significant interaction effect between Type A personality and experimenter interest was found. It has been suggested in the literature that Type As tend to work at near their maximal rate

when there is no explicit time deadline (Burnam et al., 1975; Carver et al., 1976). Further, Type As also tend to have higher quality and quantity of work performance than do Type Bs (e.g., Boyd, 1984; Glass, 1977; Matthews et al., 1980; Taylor et al., 1984). In the present study, after Type As finished their performance on a "work-related" task in the first period, they tended to carry the residual perception of the task to the free-choice period (Tang & Baumeister, 1984). In the high experimenter interest condition, Type As might have perceived their behavior in the free-choice period as a very important part of the experiment, thereby, they further exerted their effort in doing well on the task.

Type Bs are more relaxed, less competitive, and more easy-going than Type As (e.g., Ivancevich & Matteson, 1984). In the high experimenter interest condition, when Type Bs were given free choice in the experiment, they tended to be more relaxed than did those Type As. Since Type Bs also have the same level of PDC as Type As have, Type Bs also spend time on the target task in order to fulfill their role in the experiment and the requirements suggested by the experimenter. Therefore, given free choice, Type Bs in the high experimenter interest condition tended to behave in such a manner that they looked busy in the study. However, Type Bs did not work on the anagrams as hard as those Type As. The results of the present study showed that in the high experimenter interest group, Type As and Bs spent about the same amount of time on the target task, however, Type As solved more anagrams than did Type Bs.

The results of the present study further supported the notion that Type As are more productive than Type Bs (cf. Boyd, 1984; Burnam et al., 1975; Matthews et al., 1980; Taylor et al., 1984). However, it should be pointed out that Type As are more productive than Type Bs only when subjects are given specific, explicit instructions in the experiment (i.e., in the high experimenter interest

condition). In the no experimenter interest condition, no difference between Type As and Bs' task performance was found. It is possible that both Type As and Bs in the no experimenter interest group experience a low level of PDC in the present study. Thereby, Type As are just as relaxed as Type Bs during the free-choice period.

Intermediates in the experiment are different from Type As and Bs. Intermediates are not as competitive as Type As and are not as easy-going and relaxed as Type Bs. In the high experimenter interest group, intermediates spent about the same amount of time on the anagrams as Type As and Bs in order to fulfill their role in the experiment, however, they did not work as hard as Type As. The present results suggested that intermediates solved significantly less anagrams than did Type As.

In the no experimenter interest group, intermediates also spent their time on the anagrams and actually worked on the task. The results of the present investigation showed that intermediates spent about the same amount of time on the task and solved about the same number of anagrams in the experiment regardless of the experimenter interest manipulation. It appears that intermediates might have experienced a high level of PDC and thus displayed a high level of arousal in the experiment. It is also possible that intermediates are consistent and conscientious workers, thereby, they work steadily on the task regardless of whether other people are paying attention to them or not. That is, intermediates' task preference and task performance do not seem to be affected by their motive to please others or to project a favorable public image (cf. Baumeister, 1982). There was no specific measures of subjects' approval motive and conscience in the present study. Future research should also examine the relationship between intermediates' work related behavior and their social approval motive.

Further, Type As in the high experimenter interest condition solved more anagrams than did those in the no experimenter interest condition. This was also true for Type Bs. It appears that Type As and Bs' task performance during the free-choice period was affected by the manipulation of experimenter interest, whereas intermediates' was not. Thereby, the results of the Hughes et al. (1983) study were not fully supported by the present data.

The results of the present study also support the notion that Type As exhibit their coronary-prone behavior pattern only when they perceive the task as relevant to their striving for success (cf. Friedman & Rosenman, 1974; Glass, 1977; Goldband, 1980). Without such a perception, the differences between Type As and Bs are often minimal. Finally, it should be pointed out that Type Bs' low task performance during the free-choice period, as compared with that of Type As, was not caused by the lack of ability, rather, it was probably caused by the lack of demand characteristics (from the experimenter), lack of involvement and motivation, and their behavior pattern.

The implications of the present findings for an industrial work setting are suggested as follows. First, work assignments should be expressed very explicitly and clearly. Further, the results of the present investigation support the notion that goal setting (e.g., Locke, 1968; Locke, Shaw, Saare, & Latham, 1981; Locke & Latham, 1984) will help people to achieve a high level of performance in a work setting. However, the same goal setting process may not be equally applicable to Type As and Bs. That is, if goals are set for people to work on, Type Bs may simply want to look busy, or to please people who are interested in what Type Bs have to offer. Therefore, given free choice, Type Bs spend time on the task, however, they perform poorly on the task. It is plausible that close supervision or strong demand characteristics from a supervisor may keep Type Bs working at

their maximal rate of performance. The results of the present study further supported the finding that setting a specific goal combined with supervisory presence to ensure goal commitment will bring about a significant increase in productivity (cf. Latham & Locke, 1979). Future research should focus on ways of improving Type Bs' task performance on an activity.

Moreover, although Type A behavior pattern and the Protestant work ethic were correlated (e.g., Tang & Baumeister, 1984), yet these two variables had different effects on people's task preference. The results of Tang and Baumeister's (1984) study showed that subjects who endorsed the Protestant work ethic (PEs) spent more free-choice time performing the target activity that had been labeled as "work" than did subjects who opposed the work ethic. In the present study, the same anagram-solving task was also labeled as "work". However, no difference between Type As and Type Bs on task preference was found. Therefore, it appeared that given free choice, low PEs would have a much lower motive to work on a "work" related task than Type Bs. Type Bs in the present study may have a much strong motive to appear "work-oriented" than low PEs. Therefore, given free choice, Type Bs in the high experiment interest condition might have expressed a very high level of self-presentational concerns or socially desirable behavior in the study.

Recently, methods of coping with social desirability bias were discussed in the literature (cf. Nederhof, 1985). More research is needed to examine the relationship between people's Type A behavior pattern and their social approval motive in different situations.

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Table 1

Task Performance During the Free-Choice Period

Behavior Pattern	Experimenter Interest	
	High	No
Type A	18.67	1.43
Intermediate	5.00	5.17
Type B	9.29	1.29

Note. Numbers represent mean number of anagrams solved during the free-choice period.